

The Disease of Chemical Addiction

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**Drug Abuse and Addiction
are Among the Most Serious
Problems Facing Our Society**

*Utahn's severely
Dependent on
Drugs (not nicotine)*

ADULTS ~ 5%

ADOLESCENTS ~ 8%

ic Health

**Two Decades of Neurobiological
Research Have
Brought Us A New Understanding of
Drug Abuse and Addiction, Their
Complexity and their Solutions**

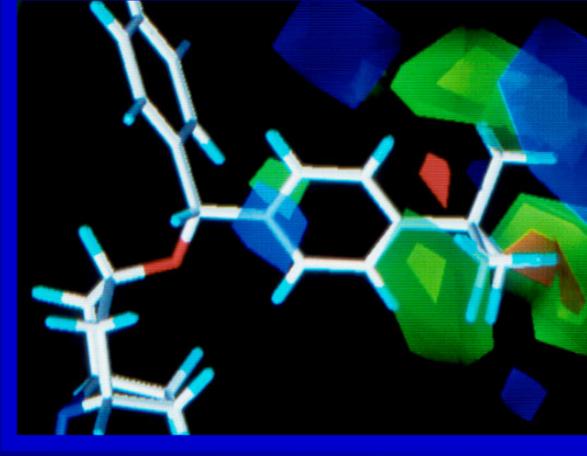
Genetics

**Gene/
Environment
Interaction**

Environment



INHERITED FACTORS **(genetic vulnerability-not** **inevitability)**



- **Common strategy to investigate**
are Twin Studies

In General: Inheritability for Drug Abuse Ranges From 40-60% (includes: alcohol, cocaine, heroin, tobacco, marijuana)

- *Some Variability Between Drugs***
- *Some Gender Variability***

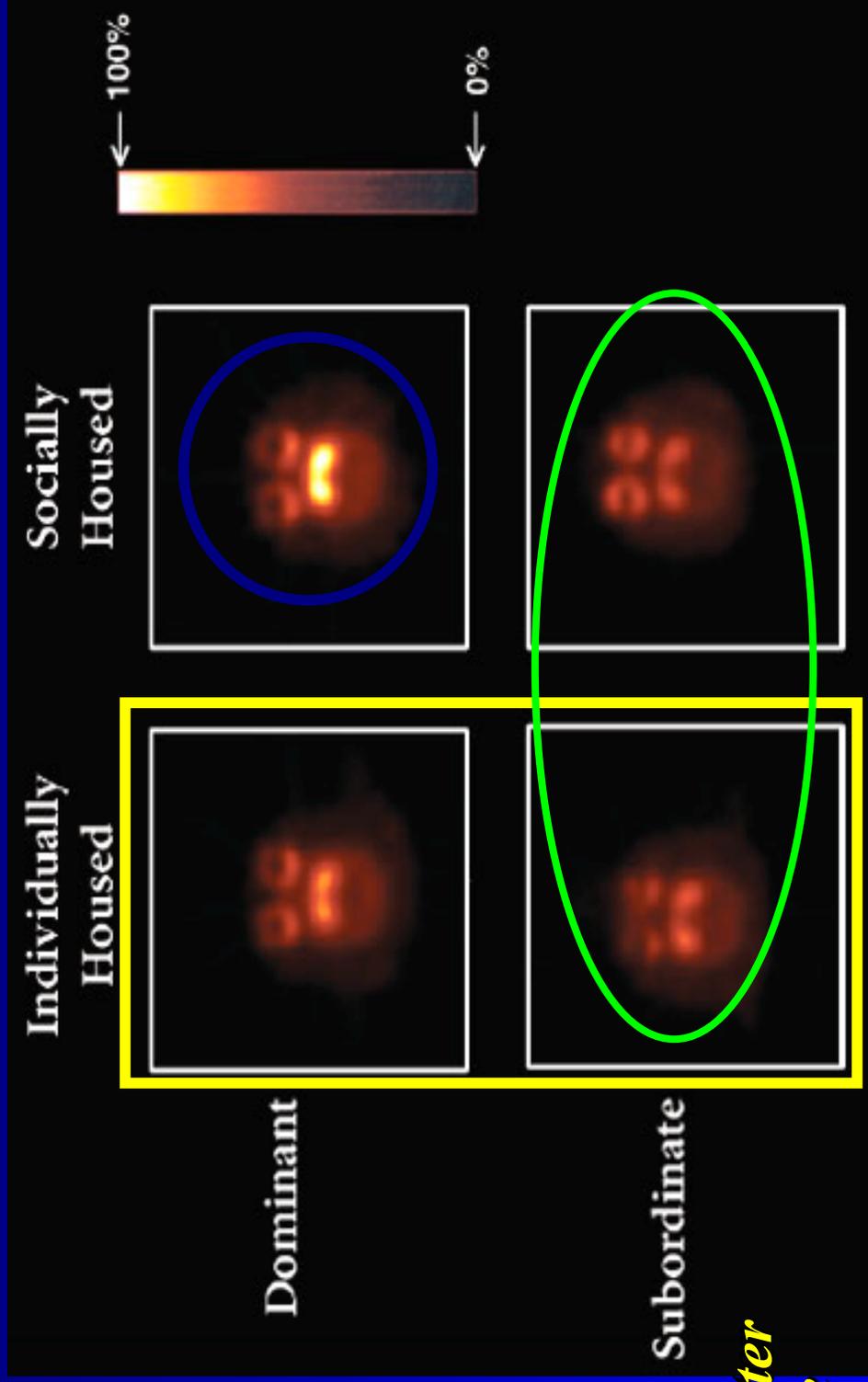
BRAIN IMAGING HELPS DRUG ABUSE RESEARCH

Positron Emission Tomography



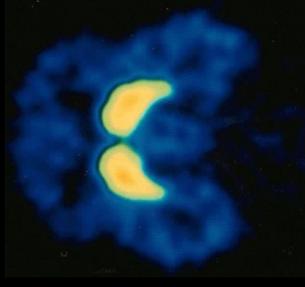
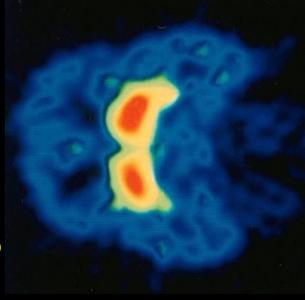
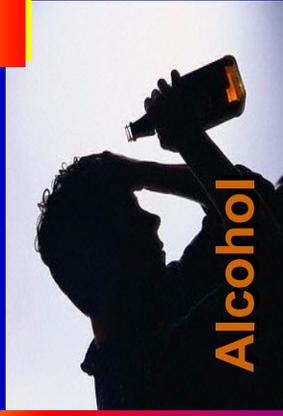
Magnetic Resonance Imaging

PET Images: Measure of Brain Reward Pathway



More likely to self-administer Cocaine

Reward System in Addiction

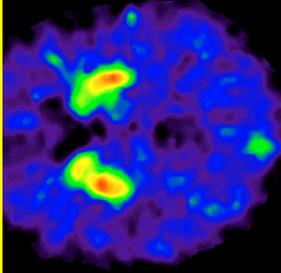
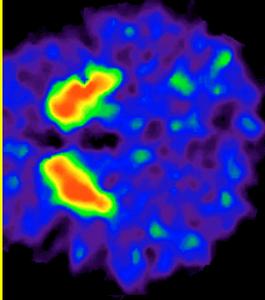


More

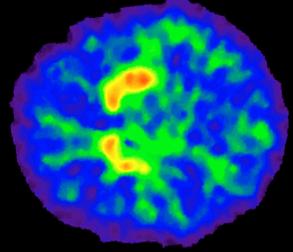
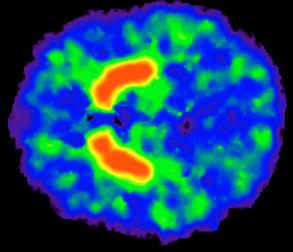


Ability to Experience Rewards Is Compromised

controls



exposed

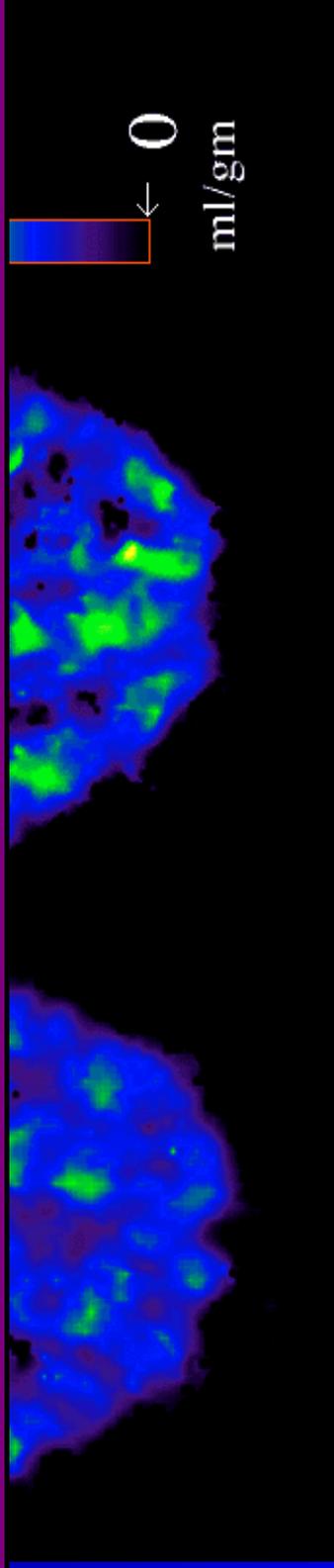


Less

Activity

Cognitive System After Heavy Methamphetamine Use (PET analysis)

*Damage to this Brain System Alters Cognitive
Functions, Such as Memory and Decision-
Making.*



Comparison Subject METH Abuser

Source: Volkow, N.D., et al., Am J. Psychiatry, 158(3), pp. 377-382, 2001.

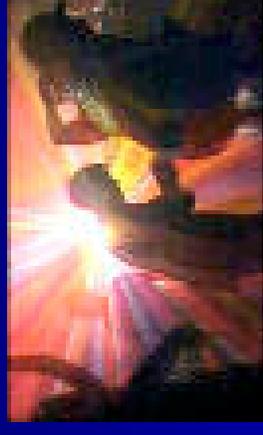
How Can We Effectively Deal With Substance Abuse and Addiction?

this is your brain on drugs.

That was then . . .

WHAT HAVE WE LEARNED?

Chemical addiction is a chronic, relapsing Brain Disease



Consequence: We cannot “hope” or “will” it away, it has a biomedical basis and effective treatment requires strategies built on science-based behavioral and pharmacological treatments

UTAH ADDICTION CENTER

Scientific

- *Pharmacology*
- *Genetics*
- *Prevention*

Clinical

- *Hotline*
- *Community outreach*
- *Primary care training*

Educational

- *Speakers' bureau*
- *Website*

Mission: *Promote the understanding, development, and application of more effective methods to prevent and treat the disease of chemical addiction*